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10/729,846	12/08/2003	Peter Larsson	4147-55	8306

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EXAMINER
JUNTIMA, NITTAYA

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 March 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-50</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>18,47 and 48</u> is/are allowed.

6)☒ Claim(s) <u>1-7,16-17,19-25,35,37-42,49 and 50</u> is/are rejected.

7)☒ Claim(s) <u>8-15,26-34,36 and 43-45</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>01 March 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>5/4/04, 8/24/04, 12/19/07</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Specification

1.   The abstract of the disclosure is objected to because it is not one paragraph; "(Fig. 4B)"

should be deleted. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-7, 19-25, and 38-42 are rejected under 35 U.S.C. 102(e) as being anticipated by

Soloway (US 6,532,212 B1).

Regarding claims 1, 19, and 38, Soloway teaches a method for forwarding information in

a multi-hop network (Fig. 1) having multiple nodes, said method comprising the steps of:

Jointly selecting, for at least one transmitting node (switch 300 in Fig. 4), i) relay node

among multiple relay candidate nodes (an adjacent switch is selected for rerouting from adjacent

switches on the shortest path to the flow's destination, col. 7, lines 35-56) and ii) at least one of:

a) Destination among multiple destinations represented in the transmit queue of said at least one transmitting node (it is inherent that when a flow is selected for rerouting from a number of flows in a transmit queue of switch 300 in Fig. 4, a destination corresponding the selected flow is also selected, col. 6, lines 31-35, 58-62, and col. 9, lines 20-43; the transmit queue must be included in switch 300 to store received frames of different flows prior to being forwarded to their destination switch(es), col. 3, lines 63-67, col. 4, lines 28-30, and col. 6, lines 31-35).

b) Flow among multiple flows represented in said at least one transmitting node (a flow is selected for rerouting, col. 6, lines 31-35, 58-62, and col. 9, lines 20-43).

Selecting a set of information (a frame belonging to the selected flow) from the transmit queue of said at least one transmitting node based on at least one of selected destination and flow (a frame with the destination D-ID corresponds to the flow selected for rerouting is selected from the inherent transmit queue for transmission, col. 4, lines 45-col. 5, line 1, and col. 9, lines 20-43).

Transmitting the selected set of information to the selected relay node (the selected frame belonging to the selected flow qualified for rerouting is transmitted to the selected adjacent switch, col. 4, lines 45-col. 5, line 1, and col. 9, lines 20-43).

Regarding claims 2, 20, and 39, Soloway teaches selecting iii) at least one link parameter (link bandwidth), and said step of transmitting the selected set of information to the selected relay node is performed based on said selected at least one link parameter (col. 7, lines 35-56 and col. 8, lines 39-42).

Regarding claims 3, 21, and 40, Soloway teaches the step of jointly selecting a combination of relay node and destination among said multiple relay nodes and said multiple destinations, and said step of selecting a set of information comprises the step of selecting a set of information (a frame) heading for the selected destination from the transmit queue (col. 4, lines 45-col. 5, line 1, col. 6, lines 31-35, 58-62, col. 7, lines 35-56, and col. 9, lines 20-43).

Regarding claims 4, 22, and 41, Soloway teaches the step of jointly selecting a combination of relay node and flow among said multiple relay nodes and said multiple flows, and said step of selecting a set of information comprises the step of selecting a set of information (a frame) belonging to the selected flow from the transmit queue (col. 4, lines 45-col. 5, line 1, col. 6, lines 31-35, 58-62, col. 7, lines 35-56, and col. 9, lines 20-43).

Regarding claims 5, 23, and 42, Soloway also teaches that the step of jointly selecting is performed based on information representing link performance (link traffic) between said at least one transmitting node (switch 300 in Fig. 4) and each one of said multiple relay candidate nodes (col. 7, lines 35-67 and col. 8, lines 18-25).

Regarding claims 6 and 24, Soloway also teaches that the step of jointly selecting is performed based on optimization of an objective function that includes information cost progress (improving cost function on the old link, col. 8, lines 54-col. 9, lines 19.

Regarding claims 7 and 25, Soloway also teaches that the step of jointly selecting is

performed based on at least one QoS parameter (link bandwidth, col. 7, lines 35-67 and col. 8,

lines 18-42).

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this
or a foreign country, before the invention thereof by the applicant for a patent.

5.   Claim 46 is rejected under 35 U.S.C. 102(a) as being anticipated by the admitted prior art

(the specification, page 2, lines 11-14 and page 3, lines 2-6).

Regarding claim 46, the admitted prior art teaches a communication node (a packet radio

network router, page 3, lines 2-4) in a packet radio multi-hop network (an ad-hoc network, page

2, lines 11-14 and page 3, lines 2-4), said communication node comprising:

Means for jointly selecting a set of data (packet) among the data buffered in the transmit

queue of said node and relay node among multiple relay candidate nodes (the router must select a

packet from among packets stored in its inherent transmit queue and select a router from among

several routers using random-but-forward routing by Sylvester and Kleinrock, page 3, lines 2-6).

Means for transmitting the selected set of data to the selected relay node (the packet is

heading in the correct direction, page 3, lines 2-6).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims 16 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soloway

(US 6,532,212 B1) in view of Cole (US 2003/0237041 A1).

Regarding claims 16 and 35, Soloway does not explicitly teach the step of said selected

relay candidate node replying, to said at least one transmitting node, with an acknowledgement

confirming reception of said selected set of information.

However, Cole teaches that in a Fibre Channel protocol, a receiving node transmits an

acknowledgement acknowledging receipt of data to a sending node (equivalent to the step of

said selected relay candidate node replying, to said at least one transmitting node, with an

acknowledgement confirming reception of said selected set of information). See paragraph

0005.

Given the teaching of Cole, it would have been obvious to one skilled in the art to modify

the teaching of Soloway such that the step of said selected relay candidate node replying, to said

at least one transmitting node, with an acknowledgement confirming reception of said selected

set of information would be included. The suggestion/motivation to do so would have been to

provide a talk back between the sending and receiving nodes for control purposes (Cole,

paragraph 0005).

8.   Claims 17 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soloway

(US 6,532,212 B1) in view of the admitted prior art (the specification, page 2, lines 6-14).

Regarding claims 17 and 37, Soloway does not teach that said multi-hop network (Fig. 1)

is a packet radio network. However, the admitted prior art teaches a multi-hop network that is a

packet radio network (ad-hoc network with mobile nodes, the specification, page 2, lines 6-14).

Therefore, it would have been obvious to one skilled in the art at the time of the invention

to include a multi-hop packet radio network as claimed in order for the method/system of claim

1/19 to be adapted to and implemented in such a network as suggested by Soloway (Soloway,

col. 3, lines 9-13).

9.   Claims 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soloway

(US 6,532,212 B1).

Claims 49 and 50 are control node claims and contain similar limitations to claim 38 with

the exception that the means for joint selecting is comprised in the control node and that the

control node comprises means for transmitting information on (i)the selected destination node

and relay node/(ii) the selected flow and relay node to the transmitting node to enable data to be

forwarded for the selected destination node/flow from the transmitting node to the selected relay

node. Soloway teaches a distributed routing scheme in which means for joint selection is

comprised by the transmitting node itself, not the control node as claimed (see rejection of claim

38). Soloway also fails to teach the control node that comprises means for transmitting

information on (i) the selected destination node and relay node/(ii) the selected flow and relay

node to the transmitting node to enable data to be forwarded for the selected destination

node/flow from the transmitting node to the selected relay node.

However, an official notice is taken that it is well known in the art to use a centralized

routing scheme in which a centralized control node performs routing decisions (means of

selection) for its members (the transmitting node) and forwards the routing instructions based on

those decisions to its member (transmitting information on the selection to the transmitting node)

in order to gain benefits from better network utilization and ease of deployment, scale, and

upgrades.

Therefore, it would have been obvious to one skilled in the art at the time of the invention

to implement the teaching of Soloway in a centralized manner such that the control node having

the means for joint selecting and means for transmitting information on (i) the selected

destination node and relay node/(ii) the selected flow and relay node to the transmitting node to

enable data to be forwarded for the selected destination node/flow from the transmitting node to

the selected relay node would be included for better network utilization and ease of deployment,

scale, and upgrades.

Allowable Subject Matter

10.   Claims 8-15, 26-34, 36, and 43-45 are objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

11.   Claim 18 is allowed. The prior art alone or in combination fail to teach or make obvious

on the following when considered in combination with other limitations in the claim: selecting a

11. Claims 18 and 47-48 are allowed. The prior art alone or in combination fail to teach or make obvious on the following when considered in combination with other limitations in the claim:

selecting a set of information from the transit queue of said at least one transmitting node based on at least one of selected destination and flow, and transmitting said selected set of information from said transmitting node to the selected relay node, using substantially the same at least one predetermined transmit parameter that was used for probe transmission and said selected link mode scheme as recited in claim 18,

means for selecting a set of information from the transmit queue of said at least one transmitting node based on at least one of selected destination and flow and means for transmitting the selected set of information to the selected relay node based on said selected modulation and coding scheme as recited in claim 47, and

means for selecting a set of information from the transmit queue of said at least one transmitting node based on at least one of selected destination and flow and means for transmitting the selected set of information to the selected relay node based on said selected at least one frequency channel as recited in claim 48.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.
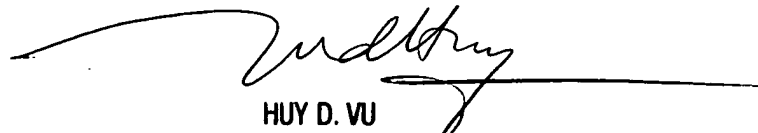
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nittaya Juntima
2/19/2008 NJ

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